

Healthy lifestyle interventions in general practice

Part 2: Lifestyle and cardiovascular disease

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Abstract

This article forms the second part of the series on the role of lifestyle modification in general practice with specific reference to chronic cardiovascular disease. Whilst the major risk factors which constitute an unhealthy lifestyle were discussed in part 1 of this series, the focus of part 2 will give specific practical guidelines which the general practitioner may incorporate into their practice when counselling patients with chronic cardiovascular disease.

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Introduction

It is apparent that the lifestyle choices of physical inactivity, smoking, poor diet and neglect of chronic life-stress, play major roles in the pathogenesis of cardiovascular disease. In-depth discussion regarding smoking cessation is beyond the scope of this article and guidelines can be found elsewhere.¹⁻⁶ The focus of this article will concentrate on physical activity guidelines and basic principles of lifestyle interventions with respect to dietary and stress management.

Physical inactivity

It is evident that many patients with chronic cardiac disease should undertake regular physical exercise instead of prolonged bed rest. Indeed, there are truly very few contraindications to participation in some form of regular physical exercise. Whilst patients who are counselled merely to "walk as much as possible" as exercise management after cardiac disease are perhaps better off than doing no exercise whatsoever, often the exercise prescription is ineffective or patients become non-compliant. It is for this reason that exercise is most effectively delivered through a supervised exercise rehabilitation programme that incorporates not only exercise training but also dietary management, psychological support, therapeutic education and vigorous risk-factor modification. Thus chronic disease rehabilitation services are comprehensive programmes designed for delivery of secondary prevention; to limit the physiological and psychological effects of cardiovascular disease, control cardiac symptoms and reduce the risk of subsequent events by stabilising or partially reversing the underlying atherosclerosis process.

A secondary prevention or rehabilitation programme may include patients who have had coronary artery disease, myocardial infarction, heart failure, bypass surgery, pacemaker implantation, cardiac transplantation, valve replacement, coronary angioplasty with or

without stent placement, or who have other evidence of cardiovascular disease (including a positive stress test), angina pectoris or other evidence of disease from a radionuclide study or coronary catheterisation.

Two recent meta-analyses have shown that the evidence behind the use of cardiac rehabilitation in the management of patients with coronary heart disease (CHD) is strong.^{7,8} Indeed exercise-based cardiac rehabilitation reduced all cause mortality by 20% and reduced cardiac mortality by 26%. Furthermore there is a strong positive effect of physical exercise training on pathogenesis of the disease, symptoms specific to the pathology, physical fitness and strength and quality of life.⁸

However, prescribing exercise for patients with chronic disease can be complex. The objective is to decrease physiological limitations and improve physical capacity through specific exercise therapy. The major dilemmas are not in determining which exercise therapies to use but in defining goals and choosing the appropriate training intensity, duration and frequency. It is important that the practitioner advises the appropriate exercise prescription for the appropriate stage of the disease and disability.

Physiological mechanisms whereby exercise training is effective in the secondary prevention of cardiovascular disease

- The following physiological mechanisms are thought to play a role in facilitating the above mentioned health benefits:
 - Improvement in blood lipid concentrations⁹
 - Reduced systolic and diastolic blood pressure
 - Increased fibrinolysis
 - Reduced thrombocyte aggregation
 - Reduced endothelial dysfunction of the coronary arteries¹⁰
 - Increased autonomic tone and heart rate variability

- Decreased cardiac arrhythmias¹¹
- Improvement of insulin resistance and glucose intolerance
- Improved psychosocial factors
- Improved lifestyle choices
- Reduced obesity
- Reduced smoking habit
- Improved functional capacity

Due to the widespread acceptance of the importance of exercise rehabilitation in the secondary prevention of cardiovascular disease, a number of important position statements and guideline documents have been published by various medical associations.¹²⁻¹⁷

Practical considerations in prescribing exercise for the secondary prevention of chronic cardiovascular disease

The following are the main practical considerations with respect to exercise training in patients with cardiovascular disease:

- Prior to starting with regular exercise training all patients should be assessed by a cardiologist or medical practitioner skilled in exercise testing and prescription. Contraindications for exercise training in patients with cardiovascular disease should be excluded. (Table I).

Table I: Contraindications for exercise testing and training

1. Unstable angina
2. Resting systolic blood pressure > 200 mmHg
3. Resting diastolic blood pressure > 110 mmHg
4. Orthostatic blood pressure drop of > 20 mmHg with symptoms
5. Critical aortic stenosis
6. Acute systemic illness or fever
7. Uncontrolled atrial or ventricular arrhythmias
8. Uncontrolled sinus tachycardia > 120 b/min
9. Uncompensated cardiac failure
10. 3-degree heart block without a pacemaker
11. Active pericarditis or myocarditis
12. Recent embolism
13. Thrombophlebitis
14. Resting ST segment depression > 2 mm
15. Uncontrolled diabetes
16. Severe orthopaedic conditions that would prohibit exercise
17. Other metabolic conditions including acute thyroiditis, hypokalaemia, hyperkalaemia, hypovolaemia etc

- Following exclusion of the above criteria, patients should undergo an exercise stress test in order for the practitioner to risk-stratify the patient. Medical supervision is suggested for moderate-to-high-risk patients, e.g. those with exercise-induced myocardial ischaemia with possible ST-segment depression and/or angina pectoris and those with left ventricular ejection fraction < 30%, arrhythmia, clinical depression, low exercise tolerance or those patients unaccustomed to exercise. Higher-risk patients are generally monitored more intensely and frequently than low-risk patients. Risk stratification should be repeated at 3 month intervals.
- Exercise training programmes should be individualised and based on the patient's initial test of functional capacity.
- Tests of functional capacity should include an exercise stress electrocardiogram and a six-minute walk test. The six-minute walk test can be easily and inexpensively used to monitor the patient's progress with respect to functional capacity.
- Exercise programming should include cardiovascular endurance, muscle strength, muscle endurance, flexibility and core stability exercises. The programme should consist of a warm-up session,

exercise training session and cool down.

- The patient's body composition and anthropometry should be measured before embarking on the programme and re-evaluated at 6–12 week intervals.
- Initiate the program at low level exercise and build up slowly, as tolerated, in very small increments.
- Low-fit patients (functional capacity 5 METs) can often train at 40–50% VO_2 peak. However, 70% of VO_2 peak is appropriate for most low-moderate risk patients.
- Monitor patients at each exercise session for abnormal signs and symptoms including chest pain or pressure, dizziness and arrhythmia. Telemetry monitoring can be used on higher risk patients.
- High-intensity exercise may precipitate cardiovascular complications in post-MI patients. Reserve high-intensity exercise for stable low-risk, fit patients.
- Log books with a patient's attendance, medication changes, exercise frequency, intensity and duration, as well as recordable cardiovascular measurements, should be kept. This alerts the practitioner to developing trends in signs and symptoms and enhances patient compliance.
- Patients should be encouraged to exercise at least three times a week for 30–40 minutes at a time. Condition specific exercises for orthopaedic conditions should also be included. As patients become fitter and become proficient with self-monitoring, additional home-based physical activity is prescribed for other days of the week.
- Be aware of a sudden onset of exhaustion as well as insufficient recovery and overtraining.
- Complete emergency resuscitation facilities should be available at the exercise training venue.
- When in doubt about progression of the exercise programme, increase in very small increments. Don't encourage competition in the rehabilitation setting.
- Guidelines for progression from clinical or professional supervision to independent exercise are listed in Table II.

Table II: Guidelines for the progression from clinical or professional supervision to independent exercise.

1. Functional capacity twice the level of occupational demand
2. Appropriate haemodynamic response to exercise (increasing systolic blood pressure with increasing work load) and recovery
3. Appropriate ECG response at peak exercise with unchanged conduction, benign ischaemia (< 1 mm ST segment depression), stable or benign arrhythmias
4. Cardiac symptoms stable or absent
5. Controlled baseline heart rate and blood pressure
6. Patient has achieved adequate management of risk factors
7. Patient has demonstrated knowledge of the disease process, abnormal signs and symptoms, medication use and side effects

Not all patients are able to, or wish to participate in a supervised exercise rehabilitation programme. For these patients, home exercise rehabilitation should be encouraged as an alternative as it costs less and might be more convenient and perhaps would encourage independence and self-responsibility.

With the advent of the data supporting physical activity in the management of chronic illness and the subsequent publication of official position stands and statements by numerous professional bodies advocating the use of physical exercise in the management strategies, so the growth of professionals in the field of exercise science and sports medicine has occurred. Thus globally, sports physicians, physical therapists, biokineticists, exercise physiologists and athletic trainers have embraced this domain of intervention and

from many postgraduate training programmes have emerged teaching specific techniques and approaches to chronic illness management. Indeed, at present there are pilot programmes to include aspects of exercise and positive lifestyle interventions in the undergraduate training of primary care doctors in various medical schools in South Africa. Thus, locally, many new programmes are increasingly being offered and the above discussion hopefully allows the practitioner to determine the quality of the various choices of programmes on offer.

Stress management

Understanding and addressing stress is an important and integral component of lifestyle modification in cardiac disease. The pervasive human experience of stress may be understood as a threat (real, implied or perceived) to homeostasis, and the integrated, multi-system mechanisms needed to maintain a stable internal milieu in the face of the perturbation. The stress response, while adaptive in the short term, can be deleterious when activated chronically, particularly in the face of psychological stressors where demands exceed the individual's capacity to cope. Under conditions of chronic stress, an inefficient inactivation of stress-induced molecules results in cellular overexposure to these substances, which along with dysregulation of the autonomic nervous system, has pathophysiological consequences.^{18, 19}

Psychological factors, including depression, anxiety, certain character traits, chronic life stress and unhealthy behaviours contribute significantly to the pathogenesis and expression of coronary artery disease,²⁰ while chronic stress, especially work stress, predicts cardiovascular morbidity and mortality.²¹ Furthermore, managing a chronic condition, irrespective of aetiology, becomes its own stressor, whether it is related to compliance, undesired effects of poly-pharmacy, living with distressing symptoms, disruption to daily functioning or the emotional impact of recognising physical limitations or mortality.

While there can be little argument as to the clinical significance of chronic psychological stress in chronic disease, and cardiac disease in particular, at the clinical interface it is a major challenge for family physicians and general practitioners to accurately assess the contribution of stress factors, in a time-limited consultation. Nonetheless evidence is increasingly clear that substantive stress reduction is an essential component of the long-term management of cardiac patients,²² and in this context, it is valuable for general practitioners to consider a separate follow-up appointment to deal with these issues directly.

Whilst the assessment of stress utilising questionnaires including depression, anxiety and stress hardiness inventories are helpful if available, the practitioner should rely on a combination of skilful questioning and attentive listening, with primacy given to the subjective experience of the patient. Because psychological stress invariably involves a degree of vulnerability, the attitude of the clinician in creating a receptive and non-judgemental clinical environment will contribute significantly to the emergence of the necessary information. A basic evaluation of stress for the practitioner to use is presented in Table III.

Table III. A basic clinical assessment of stress in patients with chronic cardiovascular disease.

<ul style="list-style-type: none"> Enquire directly if stress is a factor in the patient's illness or a response to their living with a chronic disease (the simplest and most effective form of stress assessment)
<ul style="list-style-type: none"> Enquire directly if the patient has unhealthy behaviours (smoking, sedentary lifestyle, poor nutrition)
<ul style="list-style-type: none"> Determine the presence of other addictive behaviours: alcohol, drugs (prescription and illicit), food (comfort eating especially) and excessive spending, as evidence of reduced coping capacity

<ul style="list-style-type: none"> Enquire about symptoms of reactive or major depression, and anxiety (use of validated inventories is suggested)
<ul style="list-style-type: none"> Enquire directly regarding emotional and/or mental distress at the implication of having to live with a chronic disease. (Men are less likely to express emotional vulnerability).
<ul style="list-style-type: none"> Determine the presence of Emotional Reactivity: quick to anger, increased relational conflict both at work and at home
<ul style="list-style-type: none"> Determine the presence of stress-related symptoms including tension headaches, irritable bowel syndrome, disrupted sleep or fatigue (Men are more likely to somatise emotions than women)

Whilst the evidence-base of the role of stress and stress management in cardiac disease is fairly strong²³; there is no singular approach to managing stress in this clinical context. Because the contribution and consequence of stress is complex and idiosyncratic, each patient needs to be assessed and managed on their own merits. However it is useful for the practitioner to appreciate some of the overarching concepts of stress reduction which they can hold in mind as a contextual frame. The primary principle, most simply put, is that it is not the stress per se that is the problem, but how one responds to it. The patient, then, resides at the epicentre of their own stress reduction programme. The more aware, engaged and proactive the patient, the more the perception and sense of control is internalised and thus enhanced.

There is thus no singular intervention in this regard; rather the practitioner should consider an integrated approach in which techniques and therapies are introduced either one by one, or in parallel. Suggestions for the practitioner to use for basic stress reduction are listed in Table IV.

Table IV: Stress management options for patients with chronic cardiovascular disease

General practitioner counselling:
<ul style="list-style-type: none"> Attuned and non-judgmental listening for regular short sessions (6-8 weeks) Psychoeducation with relation to diet and smoking cessation emphasising the clinical significance of increased self-efficacy Direct counseling with relation to smoking cessation
Potential general practitioner stress intervention:
<ul style="list-style-type: none"> Training to elicit the Relaxation Response: biofeedback, Benson's relaxation response
Referral sources for stress reduction:
<ul style="list-style-type: none"> Addiction Support (AA, NA, CODA, SLAA) Eliciting the Relaxation Response: biofeedback, meditation (Mindfulness, Transcendental Meditation), yoga (Hatha, Iyengar, Kundalini, Bikram), Tai'Chi Mindfulness Based Stress Reduction (MBSR) Mindfulness Based Cognitive Therapy to prevent depressive relapse (MBCT) Psychotherapy (Cognitive Behavioural Therapy, Psychodynamic therapy, Jungian therapy)

The therapeutic aim should be for patients to enhance resilience, increase and optimise response flexibility, elicit the relaxation response regularly and to refine healthy self-regulation. Furthermore, interpersonal stress both at home or at the workplace is a significant stressor. While connectedness is a significant buffer against stress-related disorders, patients should be encouraged to address unhealthy or conflictual relational dynamics directly through the support of a counselor, therapist or coach.

Dietary Intervention

There is evidence that indicates that the rising rate of coronary artery disease (CAD) can in part be attributed to the typical "Western diet" – heavy on salt, sugar and unhealthy fats. Indeed, as societies develop and become more westernised, poor lifestyle choices seem to

spread across the globe, increasing the health risk to populations for whom heart disease was never a major concern.²⁴ Advising dietary change can significantly lower the risk of developing and assist in the management of patients with CAD and therefore this should form an important part of the intervention with patients who have CAD.

General practitioners have an important role in advocating the nutritional changes necessary to manage patients with CAD.

Progression of atherosclerosis is particularly affected by a diet high in saturated fat, trans fatty acids and dietary cholesterol. These compounds are found in many popular foods, including processed and "fast" foods, fatty cuts of meat, excessive use of eggs and full fat dairy products. General practitioners should advise their patients to adopt a diet aimed at maintaining LDL cholesterol concentrations low, and HDL cholesterol concentrations high.^{25, 26} Advice to patients in this respect would include the recommendations listed in Table V:

Table V: Practical dietary recommendations for lifestyle modification in patients with chronic cardiovascular disease^{27, 28}

<ul style="list-style-type: none"> • Consume a diet rich in fruits and vegetables • Increase the intake of whole-grain, high-fibre foods in preference to refined products (including white bread and white pasta) • Increase consumption of fish, especially oily fish, to at least twice a week • Minimise fat intake, and give preference to unsaturated fat particularly mono-unsaturated fat, and avoid saturated fats wherever possible. Eliminate trans-fats from the diet altogether. • Reduce salt intake and advise moderate consumption of alcohol and increase consumption of potassium as this has been shown to lower blood pressure in patients with hypertension. • Increase intake of antioxidants which lower inflammation. Antioxidant-rich foods include red grapes, red wine, tea (especially green tea) and cocoa. • Reduce intake of omega-6 fats and increase intake of omega-3 fats as this has been shown to reduce inflammation. Omega-3 fats are found in seeds (particularly flaxseeds), green leafy vegetables, nuts and fatty fish, while omega-6 fats are found in a range of some nuts, seeds, and oils. Fatty fish including salmon, mackerel, tuna and sardines are high in omega 3 fatty acids. If patients cannot eat at least two servings of fatty fish per week, omega 3 fish oil can be ingested as a supplement. • It is also important to control the intake of triglycerides which are associated with reduced HDL cholesterol concentrations. Excessive intake of alcohol, saturated and trans fat, sugar, refined starch and calories, particularly in addition to physical inactivity can result in an elevation of triglyceride concentrations
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Maintenance of healthy body weight

As obesity is a major risk factor for chronic cardiovascular disease and diabetes, general practitioners can use the Body-Mass Index (BMI) as a tool to determine the level of weight-related risk. BMI can be calculated as weight/height.² In general, the higher the BMI, the greater change a patient needs to institute to their diet and lifestyle in order to manage obesity, and chronic cardiovascular disease. A desired BMI is between 18.5-25.

Elevated waist circumference is a sign of the metabolic syndrome and thus risk of progression of chronic cardiovascular disease. Global recommendations advocate a waist circumference of no more than 88cm for women and 102 cm for men. These two abovementioned tools can be easily incorporated into the physical examination as they are not time consuming, and can be used not only to determine risk but can also be helpful in the ongoing monitoring of patients with chronic cardiovascular disease.

We advise the incorporation of the two measurement tools into the clinical evaluation of all patients. If there is limited time available during the consultation to discuss a healthy diet, suggest the abovementioned basic recommendations. A prepared patient hand-out might be useful to reinforce these recommendations. If the patient requires more detail, remains overweight despite advice, or

has other co-morbidities including diabetes, a formal referral to a dietician is important.

Conclusion

This article has provided an overview of the basic lifestyle modifications to consider in the management of patients with chronic cardiovascular disease. A holistic view with respect to exercise training, dietary modification and adequate stress management approaches are all important in patient management. All patients should be afforded the time and interest of their general practitioner so that they may assist their patients in making good and well informed choices with respect to their lifestyle. 🙋

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